Computing Progression of Skills

	EYFS	YEAR 1	YEAR 2`	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Computer Science **KS1 NC**: Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. Create and debug simple programs. Use logical reasoning to predict the behaviour of simple programs. **KS2 NC:** Design, write and debug programs that accomplish specific goals, including controlling or	**Robots:** - To be able to describe a route that is in progress and a route taken by another person while it is being enacted. - To be able to follow a route taken by another person after it has been enacted. - To plan routes for toy vehicles and follow plans for toy vehicles. - To use the buttons on a floor robot to make it move developing to	**Outcome:** Children **understand that an algorithm is a set of instructions** used to solve a problem or achieve an objective. They know that a computer program turns an algorithm into code that the computer can understand.	**Outcome**: Children can **explain that an algorithm is a set of instructions to complete a task.** When designing simple programs, children show an awareness of the need to be **precise with their algorithms** so that they can be successfully converted into code.	**Outcome:** Children can turn a simple real-life situation into an algorithm for a program by **deconstructing it into manageable parts.** Their design shows that they are thinking of the desired task and how this translates into code. Children can **identify an error within their program** that prevents it following the desired algorithm **and then fix it**	**Outcome:** When turning a real-life situation into an algorithm, the children's design shows that they are thinking of the **required task** and **how to accomplish this in code using coding structures for selection and repetition.** Children make more intuitive attempts to debug their own programs.	**Outcome:** Children may attempt to turn **more complex** real-life situations into algorithms for a program by **deconstructing it into manageable parts.** Children are able to test and **debug their programs** as they go and can use **logical methods** to identify the approximate cause of any bug but may need some support identifying the specific line of code.	**Outcome:** Children are able to turn a more complex programming task into an algorithm by **identifying the important aspects of the task (abstraction)** and then **decomposing them in a logical way** using their **knowledge of possible coding structures** and applying skills from previous programs. **Children test and debug their program** as they go and use logical methods to identify the cause of bugs, demonstrating a

simulating physical systems; solve problems by decomposing them into smaller parts. Use sequence, selection and repetition in programs; work with variables and various forms of input and output. Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities	using buttons with greater purpose e.g., program several buttons to make it move. • To be able to interpret simple instructions to predict an outcome. To be able to plan and input instructions for a floor robot building up to several steps.						**systematic approach** to try to identify a particular line of code causing a problem.
		Outcome: Children can **work out what is wrong with a simple algorithm when the steps are out of order**, e.g. The Wrong Sandwich in Purple Mash and **can write their own simple algorithm**, e.g. Colouring in a Bird activity. Children **know that an unexpected outcome is due to the code they have created** and can make logical attempts to **fix the code,** e.g. Bubbles activity in 2Code	**Outcome:** Children can **create a simple program** that achieves a specific purpose. They can also **identify and correct some errors**, e.g. Debug Challenges: Chimp. Children's program designs display a growing awareness of the need for logical, programmable steps.	**Outcome**: Children demonstrate the **ability to design and code a program that follows a simple sequence.** They **experiment with timers to achieve repetition effects** in their programs. Children are beginning to understand the difference in the effect of using a timer command rather than a repeat command when creating repetition effects	**Outcome:** Children's **use of timers to achieve repetition effects are becoming more logical and are integrated into their program designs.** They **understand 'IF statements' for selection** and attempt to **combine these with other coding structures** including variables to achieve the effects that they design in their programs. As well as **understanding how variables can be used to store information**	**Outcome:** Children **can translate algorithms that include sequence, selection and repetition into code** with increasing ease and their own designs show that they are thinking of how to accomplish the set task in code utilising such structures. They are **combining sequence, selection and repetition** with other coding structures to achieve their algorithm design.	**Outcome:** Children translate algorithms that include sequence, selection and repetition into code and their own designs show that they are thinking of how to accomplish the set task in code utilising such structures, **including nesting structures within each other.** Coding displays an improving **understanding of variables** in coding, outputs such as sound and movement, inputs from the

					while a program is executing, they are able to use and manipulate the value of variables. Children can make use of user inputs and outputs such as 'print to screen'. e.g. 2Code		user of the program such as button clicks and the value of functions.
they offer for communication and collaboration.		**Outcome**: When looking at a program, **children can read code one line at a time** and make good attempts to **envision the bigger picture** of the overall effect of the program. Children can, for example, **interpret** where the turtle in 2Go challenges will end up at the end of the program	**Outcome**: Children can **identify the parts of a program** that respond to **specific events and initiate specific actions**. For example, they can write a cause and effect sentence of what will happen in a program.	**Outcome:** Children's **designs for their programs** show that they are thinking of the **structure of a program in logical, achievable steps and absorbing some new knowledge of coding structures**. For example, repetition and use of timers. They make good **attempts to 'step**	**Outcome:** Children's **designs for their programs** show that they are thinking of the **structure of a program in logical, achievable steps and absorbing some new knowledge of coding structures.** For example, 'IF' statements, repetition and variables. They can **trace code**	**Outcome:** When children code, they are **beginning to think about their code structure in terms of the ability to debug and interpret the code later**, e.g. the use of tabs to organise code and the naming of variables.	**Outcome:** Children are able to **interpret a program in parts** and can make **logical attempts to put the separate parts of a complex algorithm together** to explain the program as a whole.

				through' more complex code in order to identify errors in algorithms and can correct this. e.g. In programs such as Logo, they can 'read' programs with several steps and predict the outcome accurately.	and use step-through methods to identify errors in code and make logical attempts to correct this. In programs such as Logo, they can 'read' programs with several steps and predict the outcome accurately.		
				Outcome: Children can list a range of ways that the Internet can be used to provide different methods of communication. They can use some of these methods of communication, e.g. being able to open, respond to and attach files to emails using 2Email. They can describe	Outcome: Children recognise the main component parts of hardware which allow computers to join and form a network. Their ability to understand the online safety implications associated with the ways the internet can be used to provide different	Outcome: Children understand the value of computer networks but are also aware of the main dangers. They recognise what personal information is and can explain how this can be kept safe. Children can select the most appropriate form of online	Outcome: Children understand and can explain in some depth the difference between the internet and the World Wide Web. Children know what a WAN and LAN are and can describe how they access the Internet in school.

| | | appropriate email conventions when communicating in this way. | methods of communication is improving. | communications contingent on audience and digital content, e.g. 2Blog, 2Email, Display Boards. | |

| **Information Technology**

KS1 NC
Use technology purposefully to create, organise, store, manipulate and retrieve digital content.

KS2 NC
Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.

Select, use and combine a variety | **Keyboard skills:**
• To be able to find individual letters on the keyboard.
• To use the spacebar.
• To be able to delete using the backspace key and the DELETE key.
• To be able to type both uppercase and lowercase letters using CAPS LOCK and shift.
• To be able to type numbers. | **Outcome:** Children are able to **sort, collate, edit and store simple digital content** e.g. children can name, save and retrieve their work and follow simple instructions to access online resources, use Purple Mash 2Quiz example (sorting shapes), 2Code design mode (manipulating backgrounds) or using pictogram software such as 2Count | **Outcome:** Children demonstrate an ability to **organise data using**, for example, a database such as 2Investigate and can **retrieve specific data** for conducting simple searches. Children are able to **edit more complex digital data** such as music compositions within 2Sequence. Children are **confident when creating, naming, saving and** | **Outcome:** Children can **carry out simple searches to retrieve digital content.** They understand that to do this, they are connecting to the internet and using a search engine such as Purple Mash search or internet-wide search engines. | **Outcome:** Children **understand the function, features and layout** of a search engine. They can **appraise selected** webpages for credibility and information at a basic level. | **Outcome:** Children **search with greater complexity** for digital content when using a search engine. They are able to **explain in some detail** how credible a webpage is and the information it contains. | **Outcome:** Children **readily apply filters** when searching for digital content. They are able to **explain in detail** how credible a webpage is and the information it contains. They **compare** a range of digital content sources and are able to **rate** them in terms of content quality and accuracy. Children **use critical thinking skills** in everyday use of online communication. |

of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.	• To be able to use the ENTER key. - To be able to use the arrow keys. To be able to use the keyboard with all the above skills.			**retrieving content.** Children use a range of **media** in their digital content including photos, text and sound.			
	Drawing skills: • To be able to select colours. • To be able to mark make purposefully on a screen. • To be able to control the pencil width. • To be able to control tools to experiment with. • To be able to use the undo function. • To be able to erase parts of pictures.			**Outcome:** Children **can collect, analyse, evaluate and present data and information using a selection of software,** e.g. using a branching database (2Question), using software such as 2Graph. Children can **consider what software is most appropriate for a given task.** They can **create purposeful content to attach**	**Outcome:** Children are **able to make improvements** to digital solutions based on feedback. Children **make informed software choices** when presenting information and data. They **create linked content using a range of software** such as 2Connect and 2Publish+. Children **share digital content within their community,** i.e.	**Outcome:** Children are **able to make appropriate improvements** to digital solutions based on feedback received and can **confidently comment** on the success of the solution. e.g. creating their own program to meet a design brief using 2Code. They **objectively review solutions from others.** Children are able to **collaboratively**	**Outcome:** Children **make clear connections to the audience** when designing and creating digital content. The children **design and create their own blogs** to become a content creator on the Internet, e.g. 2Blog. They are **able to use criteria to evaluate** the quality of digital solutions and are able to identify improvements,

	• To be able to draw using a touch screen. • To be able to draw using mouse control. **Sound:** • To experiment in the music area of Mini Mash to combine sounds. • To use the built-in sound effects in Purple Mash. • To be able to record spoken words and play these back. **Photography:** • To be able to look at photos and identify features. To			**to emails**, e.g. 2Respond.	using Virtual Display Boards.	**create content and solutions using digital features within software** such as collaborative mode. They are able to **use several ways of sharing digital content**, i.e. 2Blog, Display Boards and 2Email.	making some refinements.

	be able to take photos using a device. • To be able to use the webcam in Mini Mash. • To be able to open photos in Purple Mash. • To be able to use own photos in work on a digital device. **Quizzes:** • To know what a quiz is. -To be able to participate in a multiple-choice quiz using pictures. • To be able to participate in a sequencing quiz using pictures.					

	• To be able to answer quiz questions by typing. • To be able to participate in a cloze quiz. • To be able to participate in a sorting and sequencing quiz. • To be able to complete a quiz with mixed questions. • To be able to play a quiz game.						
Digital Literacy **KS1 NC** Recognise common uses of information technology beyond school. Use technology safely and	**Technology around us:** • To know the technology used in the home. • To be able to identify how technology is used outdoors.	**Outcome:** Children **understand what is meant by technology** and can **identify a variety of examples both in and out of school**. They can	**Outcome:** Children can **effectively retrieve relevant, purposeful digital content using a search engine.** They can **apply their learning of effective**	**Outcome:** Children **demonstrate the importance of having a secure password and not sharing this with anyone else.** Furthermore, children can	**Outcome:** Children can **explore key concepts relating to online safety using concept mapping** such as 2Connect. They can **help others to understand**	**Outcome:** Children have a **secure knowledge of common online safety rules** and can apply this by **demonstrating the safe and respectful use of**	**Outcome:** Children **demonstrate the safe and respectful use of a range of different technologies and online services.** They **identify**

respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies. **KS2 NC** Use technology safely, respectfully and responsibly; recognise acceptable/ unacceptable behaviour; identify a range of ways to report concern about content and contact.	• To be able to identify technology used in the wider world.	**make a distinction** between objects that use modern technology and those that do not e.g. a microwave vs. a chair.	**searching beyond the classroom.** They can share this knowledge, e.g. 2Publish example template. **Children make links between technology they see around them, coding and multimedia work they do in school** e.g. animations, interactive code and programs.	**explain the negative** implications of failure to keep passwords safe and secure. They understand the **importance of staying safe** and the **importance of their conduct** when using familiar communication tools such as 2Email in Purple Mash. They know **more than one way to report unacceptable content and contact.**	the importance of online safety. Children **know a range of ways of reporting** inappropriate content and contact.	**a few different technologies and online services**. Children implicitly **relate appropriate online behaviour** to their right to personal privacy and mental wellbeing of themselves and others.	**more discreet inappropriate behaviours** through developing **critical thinking**, e.g. 2Respond activities. They **recognise the value in preserving** their **privacy** when online for their own and other people's safety.
	Hardware: • To be able to take appropriate actions before using technology. • To be able to understand why food should be	**Outcome:** Children **understand the importance of keeping information**, such as their usernames and passwords, private and	**Outcome:** Children **know the implications of inappropriate online searches.** Children begin to understand how things are shared electronically such as posting				

Chesed, Resilience, Respect

	kept away from devices. • To be able to identify electrical safety as important. • To know safe ways to transport portable devices. • To be able to relate being gentle and sharing to the use of devices. • To be able to understand what technology is. • To be able to identify the main parts of a computer. **Safety and privacy:** • To be able to explain what it means to	actively demonstrate this in lessons. Children **take ownership of their work and save this in their own private space** such as their My Work folder on Purple Mash.	work to the Purple Mash display board. They **develop an understanding of using email safely** by using 2Respond activities on Purple Mash and **know ways of reporting inappropriate behaviours and content to a trusted adult.**				

	own digital content. • To be able to explain what 'private' means when using technology. • To be able to express how it feels to be uncomfortable with something. • To be able to name 5 people who can help with negative feelings. • To be able to think about how to show kindness to others. • To begin to be aware of the impact of a lot of screen time.						

		Using Purple Mash with an individual login: • To navigate to PM login page. • Using login shortcuts. • Login in picture password. • Login in numbers. • Login in words. • My work area. • 2Dos.						